IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA, ex rel, W.A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA, et al.	)	
Plaintiffs,	)	
V.	)	No. 05-CV-329-GKF-SAJ
TYSON FOODS, INC., et al.,	)	
Defendants.	)	

REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 19, 2008

PRELIMINARY INJUNCTION HEARING

VOLUME I

BEFORE THE HONORABLE GREGORY K. FRIZZELL, Judge

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Exhibit 53

Glen R. Dorrough
UNITED STATES COURT REPORTER

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PROCEEDINGS

February 19, 2008

THE COURT: Be seated, please.

THE CLERK: We're here in the matter of the Attorney General of the State of Oklahoma, et al, vs. Tyson Foods, Inc., et al, Case Number 05-CV-329-GKF. Would the parties please enter their appearance.

MR. BULLOCK: Louis Bullock for the State of Oklahoma.

MS. BURCH: Kelly Burch, State of Oklahoma.

MR. NANCE: Bob Nance for the State of Oklahoma.

MR. BAKER: Fred Baker for the State of Oklahoma.

MR. GARREN: Richard Garren, State of Oklahoma.

MR. PAGE: David Page, State of Oklahoma.

MR. EDMONDSON: Drew Edmondson, State of Oklahoma.

repeatedly. And then finally on the right-hand side I've listed the sources for this information.

Q. When we talk about the post contact latency, how does that relate to our finding people that have been made sick by being at the river?

A. It makes it much more difficult. And because of the location of the Illinois River and its recognition as a regional resource, I'm sure that you have people there on a regular basis from Kansas and Missouri and Oklahoma and Arkansas who go home when they're done. And it's very difficult to capture that with the kind of passive reporting systems that we have in place for reportable diseases at present.

Q. Now, I notice that you included both Salmonella and Campylobacter. In light of the fact that the sampling didn't turn up much of that, do you regard that as a legitimate inclusion in this chart?

A. I do.

Q. Why?

A. The literature is quite clear that both Campylobacter and Salmonella are extraordinarily commonly associated with poultry. And it's important to recognize that these have very similar kinds of effects, similar range of severity, similar types of infective dose, similar types of latency periods. So all of these are, again, being measured by the indicator

for a period of time on the order of months but, again, its significance to you is negligible.

Q. Okay. Let's go to 403, please. Now, first of all, Doctor, in terms of this contamination that you testified to in the river and waters of the Illinois River Watershed, do you have an opinion as to the cause of that contamination?

A. Yes, my belief, as we'll talk about later, that there are probably different places, perhaps contributions from other sources, but the majority of the impacts are coming from poultry. And there are a variety of reasons for that including a number of those that are listed on this sheet.

Q. Let's go through those. What does the first -- the technical literature, what are you talking about there?

A. Well, let me first say that last one tried to inadvertently place too much value on any one of these particular numbers. A scientist typically looks at things from a weight of evidence standpoint or reliance of evidence standpoint. Everything has importance, some have more importance than others. But you get to the bottom line in your conclusion by integrating several different lines of evidence. The first here is that the available and historical technical literature on characteristics of poultry waste, particularly bacterial, demonstrate the presence of E. coli, Salmonella and Campylobacter and the fecal indicator organisms in poultry waste. That is -- the literature is clear on that.

the recreational period is soon. Therefore, they're not separate in time and they have to be considered together, particularly given the rainfall, the 45 or so percent of rainfall that falls in the spring period.

Q. Do you have any issue with the persistence of bacteria in the environment?

A. Well, as we talked about a few moments ago, there are certain kinds of bacteria, particularly important infectious bacteria, that are relatively easily able to survive in the environment, certainly for periods of weeks or months. And that period can be extended dramatically by sequestration of sediment or by sequestration in larger pieces of fecal matter which subsequently break down as they're in the environment for a while. So it's true that bacteria are subjected to stresses, but bacteria aren't so bad at getting along with stresses. And so you have adaptive mechanisms, you have this viable but non culturable state which allows the bacteria to remain viable or remain alive, but not culturable. So I think there's a temporal problem there as well.

Q. Let's talk about groundwater wells. Let's put up 401. What is 401, Doctor?

A. 401 is, again, the base map of the Illinois River Watershed, both the Oklahoma portion and the Arkansas portion, which identifies the fact that there are over 1,700 wells in the Oklahoma portion of the IRW.

Q. Okay. And let's go to 400. What is Exhibit 400, Doctor?
A. 400 is a compendium of groundwater samples that were collected for which detectable bacterial concentrations were reported. There are three kinds of samples here, all of them indicating groundwater. The first is the geoprobe sample which is also known as a direct push sample which is a sample collected from the surface of groundwater without having to install a standard monitoring well.

The second are the red triangles which are springs representing that a spring is the first appearance of groundwater at the surface. And as Secretary Tolbert mentioned earlier today, springs do represent a drinking water source and have in the past in a number of locations. And then finally, the green triangles are the water wells indicating either domestic wells or installed wells that were sampled.
Q. Now, were there -- first of all, what is the standard by which -- we've talked about primary body contact. What is the standard by which groundwater is looked at?
A. The existing standard for groundwater is not present. That is no bacteria present. That's particularly true for E. coli, which is one of the measures of groundwater contamination. As a practical matter, you do occasionally find bacteria in wells as a result of surface activities. And these surface activities include the application of poultry litter to the kind of topography and geology here which you'll, I'm sure,

hear about later that doesn't filter things out very well.
Q. Now, are these all of the groundwater samples or what's the nature of the particular spring geoprobe or water well sample, why are these on here?
A. These are on here because bacteria were detected in these wells. These are wells for which bacteria were detected representing a potentially dangerous situation. And once again, it's not a situation where these values are one where the number was supposed to be zero. These number go as high as several thousand and represent, in my judgment anyway, a clear indication that there's impacts from the surface to the groundwater.
Q. Perhaps for the record, why don't you give us a little fuller explanation of what a geoprobe is.
A. Geoprobe is a small tubular device which is pushed from the surface to a depth that's determined -- previously determined. It prevents the necessity for drilling a well and then installing a casing and collecting a sample. It's becoming much more widely used in the environmental characterization field not only for chemicals but also for microorganisms as well.
THE COURT: How many wells are there here on this map that have detected bacterial contaminants?
THE WITNESS: There are between 50 and 60, maybe about 60.

Q. (By Mr. Bullock) Let's look at Exhibit 399. What is 3 -- I think I said -- yeah, 399.

A. 399 is a listing. There are six articles presented on here that are representative of the kinds of information that's out there and has been for at least, I guess the earliest one that's on here is 1980, so maybe getting on close to 30 years. And I've identified the title and the authors and I've selected some quotations out of these that I think indicate a relationship to what we've talked about so far.

Q. Okay. Are there any particular ones that you would call the Court's attention to?

A. Well, all of them. I think that the important part here to note if you just start at the first one is that Dry Poultry Manure Management is a document that was prepared by the University of Arkansas extension service, Dr. Bowls and his colleagues. And it identifies in the early '90's the fact that it is a potential pollutant of surface and groundwater if mishandled, referring to poultry waste in that article. The ultimate concern as identified by the authors here, once again, is to avoid bacterial contamination and excess nutrients in ground and surface water. Poultry producers must handle manure in ways that protect water resources. If improperly managed, poultry manure can become a liability rather than asset, causing problems in the environment and creating hazards to human and animal health. And then a listing of a couple of

ways in which manure can contaminate water.

Each of these has an important quote attributed to it and I've identified where those are located. I think each one of them clearly identifies the fact that it's recognized that the application of waste, if it's done, needs to be done in a very careful manner with recognition that fecal bacterial contamination is a clear and present danger from that process.

Q. Have you made an estimate as to the relative contribution within the IRW of common sources of fecal bacteria in the IRW?

A. Yes, I have.

Q. First of all, how did you go about making that estimate?

A. I used a procedure which is essentially the first few steps of the TMDL process, the total maximum daily load process that was described earlier, in which the bacterial source contribution is assessed, again for livestock, for septic tanks, for domestic pets, for sewage treatment plants or MPDS discharges. So there is a procedure applied, there are assumptions that are used by not only the State of Oklahoma but other states that all are required to do TMDLs. We've looked at Ohio's and Pennsylvania's and Florida's. They use similar assumptions with regard to bacterial loading, fecal loading, and it doesn't necessarily require, and, in fact, it doesn't require knowledge of the exact waste generation or mass of waste generation. What it requires is a knowledge of the number of animals and the area of the watershed that's being

affected and the land use of that watershed. So the TMDL process has developed a pathway to identify source contributions, and we applied that process.

Q. Okay. And what did you come up with when you did that calculation?

A. We identified the fact that poultry and cattle are both significant contributors from a purely numerical standpoint, but that swine are not, wastewater treatment plants are not, septic tanks are not, wildlife is not, pets are not. So you can go through that process and identify relative importance of these sources. As I mentioned earlier, at least as important, however, as the numerical contribution is the way in which that material reaches the ground and what happens to it once it reaches the ground which is what I believe professionally is what causes poultry waste to be much more important than some of the others that were discussed.

Q. Okay. So in terms of when you say that they're relative, the fecal bacteria from cattle and poultry are relatively the same, is that at the point where they go on the ground?

A. Yes, just the pure generation, not the what happens to it after it gets on the ground. That's where poultry begins to diverge from all the rest of these sources.

Q. So we're back to the cow patties don't float down the river, but the chicken litter easily floats?

A. Well, it easily floats, and it's also in a form -- in a

physical form which is much more easily leached. That is material that's in association with those particles can leave those particles and then move to other particles and eventually make its way to the surface water.

Q. Have you looked at, as part of your evaluation, at the records of reportable diseases in this area?

A. Yes, I have.

Q. And first of all, what are reportable diseases?

A. The State -- well, not only Oklahoma, but most states have a passive reportable disease system in place where either physicians or laboratories are obligated to report about 60 different kinds of diseases to the State as a record-keeping mechanism. When I say passive, the difficulty there is that it's somewhat self-regulating and it's at the mercy of people being busy. And it's at the mercy of the kinds of time delays that we mentioned earlier in terms of people's ability to assign a cause to a particular disease.

Q. Okay. Let's look at 398. What is that document?

A. This is a series of graphs from 1998 to 2005 looking at the rates of infection for Campylobacter in Adair County, Oklahoma, which is the county immediately west of the Oklahoma-Arkansas border and for which the Illinois River makes up the largest proportion of the county.

MR. TUCKER: Judge, I'd like to interpose an objection to that demonstrative exhibit because it's 2005 and this is

Q. Okay. Based on the materials that you have reviewed for this case as an expert in toxicology and risk assessment, do you have an opinion as to the role, if any, that land application of poultry waste in the IRW is playing as a source of bacterial contamination that you have identified within this watershed?

A. Yes, I think for all the reasons that I've talked about here, in my professional opinion, my toxicological and risk assessment opinion is there's a direct linkage between those and that it's representing a significant health concern that's ongoing.

Q. As an expert in toxicology and risk assessment, what is your opinion concerning allowing the existing practices of poultry waste disposal to continue?

A. I think what we know now and what we have learned indicates that that is an unwise practice that should be stopped.

Q. What is your opinion as to the degree of any risk associated with the continued application of poultry waste in this watershed?

A. I'm sorry, could you ask the question again?

Q. What is your opinion as to the degree of risk, if any, associated with the continued application of poultry waste in this watershed?

A. I think all of the data that I've reviewed and the

distribution and the time series of this bacterial contamination indicates to me it's a very significant risk.

Q. You understand what an imminent and substantial endangerment is?

A. Yes.

Q. And how does your opinion reflect in light of that?

A. Well, I believe that the imminent portion of that definition relates to closely in time, meaning that the problem needs to be resolved quickly, and I believe that is the case. I also think that the substantial portion is met by the magnitude and the frequency and the distribution of the exceedances that I've seen in the groundwater and the surface water.

Q. Doctor, when did you first form this opinion such that you could take it to state officials?

A. I would say I was involved in the case for a few months before I reached that opinion because I was reviewing data that was being provided to me. And candidly, I, at the outset, was a little skeptical for some of the reasons that, I think, other people are skeptical, but I am no longer skeptical.

Q. Well, you say that you're not skeptical now. When did you meet with state officials to inform them of the opinions which you have given here in this courtroom?

A. I met with representatives of the attorney general's office and Mr. Tolbert's office quite awhile ago, years ago.

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REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 20, 2008

PRELIMINARY INJUNCTION HEARING

VOLUME II

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MR. GEORGE: He's not going to -- I just want to make sure that someone doesn't get up later, Your Honor, and say that Dr. Teaf has conducted the fate and transport analysis here.

THE COURT: I think we've plowed that ground.

MR. GEORGE: Okay. I'll pass the witness, Your Honor.

THE COURT: Mr. Bullock.

REDIRECT EXAMINATION

BY MR. BULLOCK:

Q. Just a few things. Dr. Teaf, yesterday Mr. Tucker presented some information concerning TMDLs in various watersheds, for instance the South Canadian?

A. Yes, sir.

Q. What does the information discovered in producing the TMDL for the South Canadian River tell you about sources of pollution in the Illinois River Watershed?

A. It tells you absolutely nothing and it would be dangerous to make assumptions between watersheds.

Q. Okay. Now, a great deal has been made about the issue of finding Campylobacter or Salmonella. Is it not -- can you not culture those organisms so that you can count them?

A. Under certain circumstances it's possible to do so but both of those organisms, and E. coli as well, are well-known to be stressed in the environment to the point that they are not culturable. They're not able to be tested in a lab or grown up

in the lab, but they're perfectly infective, the bacteria are alive and well. So it's an interesting problem. It's been identified in the literature many times. And it's a real public health dilemma because you can find illnesses and you can know that the bacteria are present in the water, but you can't find the bacteria in the water because of its viable, but nonculturable state.

Q. Now, also yesterday there was examination of -- do you recall the 2007 study that the EPA did concerning the use of the indicator bacteria?

A. Yes.

Q. What was the conclusion of that study as you understood it -- or that review?

A. That there are reasons to want to try to identify better ways to do this, but that at the present time there are not those ways. They are not available to us in a commercially applicable way that states can implement. No states have changed their positions as far as I know because of that draft report.

Q. Well, what is -- following that review, what changes were made in water quality standards in this nation?

A. None.

Q. If we take out the current water quality standards, if we eliminated them, if we didn't follow them, what would we have to guide us in terms of health risks in the water bodies of